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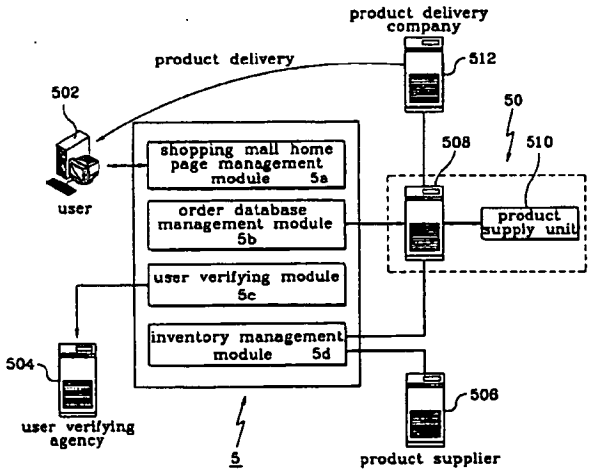

(57) Abstract: The invention relates to an on-line e-commerce system using automatic vending apparatuses with a product supply unit to store, extract and discharge out a variety of goods and a control computer to control all the automatic operations of extracting and discharging ordered goods, the system including: a shopping mall management module to provide a shopping mall home page and receive an input of shopping related data like a list of ordered goods and user verifying data like customer's credit card number; and an order data base management module to store user verifying data in conjunction with the shopping related data and transmit the order data to the control computer, wherein, if the customer computer, the order data base management module send the order data to the control computer which will automatically extract and discharge the ordered goods listed in the order data from the product supply unit and put them at a predetermined standby space and, at the same time, confirm the user verifying number data to the customer's to enable the customer to pick up the ordered goods.

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ON-LINE E-COMMERCE SYSTEM AND METHOD USING AUTOMATIC VENDING APPARATUS

FIELD OF THE INVENTION

The present invention relates to an on-line e-commerce system using an automatic vending system and a method thereof and more particularly to an on-line e-commerce system and method using automatic vending system which automatically discharges and collectively sells various goods as it is connected with wired/ wireless telecommunication networks such as internet and so on.

BACKGROUND OF THE RELATED ART

In general, according to a conventional e-commerce system, a consumer gets on the internet to be in touch with an e-commerce server, orders desired goods and inputs required information on his/her credit card number and so on. The e-commerce server transmits the consumer's credit card data and the like to a computer of a credit card verifying agency for verification. When it is confirmed that the credit card belongs to a particular customer, the computer of the credit card verifying agency sends the confirmation data to a computer of a financial agency, which transfers the payment for ordered goods to an account belonging to a shopping mall homepage operator and notifies the monetary transition to the e-commerce server.

Then, the e-commerce server sends data on a list of ordered goods and a place to get the ordered goods delivered to a computer of a product delivery company, which will deliver the ordered goods to a designated place. At this time, the product delivery company can be operated in relation with other medium/small-sized shopping centers located in many different regions.

However, there are disadvantages in the conventional e-commerce system in that the medium/small sized shopping centers are not operated so

automatically that inventory of all products is checked and managed neither on the real-time basis nor in an efficient manner, and that a personnel of manually operated shopping centers searches for each and every ordered goods to thereby delay the actual delivery.

SUMMARY OF THE INVENTION

Therefore, the present invention is disclosed to solve the aforementioned problems and it is an object of the invention to provide an on-line e-commerce system using a plurality of automatic vending apparatuses installed in a plurality of automated stores to sell a variety of products with the control computers of the automatic vending apparatuses being connected with the e-commerce server to thereby make it possible to get ordered goods automatically extracted and packaged to guarantee a reduction in delivery time to a purchaser.

In addition, it is another object of the present invention to provide an on-line e-commerce system using a plurality of automatic vending apparatuses installed in a plurality of shopping malls where the control computers of the automatic vending apparatuses are in connection with an e-commerce server to automatically manage all the inventory of goods on the real time basis.

In order to achieve the aforementioned objects of the present invention, there is provided an on-line e-commerce system using automatic vending apparatuses with a product supply unit to store, extract and discharge out a variety of goods and a control computer to control all the automatic operations of extracting and discharging ordered goods, the system including:

a shopping mall management module to provide a shopping mall home page and receive an input of shopping related data like a list of ordered goods and user verifying data like customer's credit card number; and

an order data base management module to store the shopping related data in conjunction with the customer differentiating number data as order data

and transmit the order data to the control computer; wherein, if the order data base management module receives the shopping related data from the customer computer, the order data base management module sends the order data to the control computer which will automatically extract and discharge the ordered goods listed in the order data from the product supply unit and put them at a predetermined standby space and, at the same time, sends the customer differentiating number data to the customer computer to enable the customer to pick up the ordered goods.

Preferably, the shopping related data include delivery place data, and the control computer is also kept connected with a computer of a delivery company that delivers the ordered goods from the product supply unit to a delivery place designated with the delivery place data by a customer.

At the same time, the on-line e-commerce system also includes: an inventory data base constructed to monitor inventory of all the goods stored at the product supply unit; and, if the number of goods stored at the product supply unit gets below a predetermined level thereof, an inventory management module to receive inventory refill signal data from the control computer and transmit the inventory refill signal data to a computer of a product supplier to refill goods, wherein the product supplier refills the required goods up to the predetermined number thereof if the product supplier computer receives the inventory refill signal data.

The on-line e-commerce system further includes a user verifying management module which sends the user verifying data to a computer of a user verifying agency for an approval of dealings.

In addition, in order to accomplish the aforementioned objects of the present invention, there is provided a method for operating an on-line e-commerce system using automatic vending apparatuses which respectively

include a product supply unit to store, extract and discharge a variety of goods for automated marketing processes and a control computer to control the automated operations of extracting and discharging ordered goods, the method including the steps of: receiving an input of shopping related data like a list of ordered goods and user verifying data like customer's credit card number from a customer's personal computer which is connected with a shopping mall home page provided by the on-line e-commerce system; storing the shopping related data in conjunction with the customer differentiating number data as order data; transmitting the order data to the control computer when the shopping related data is input at the customer computer; automatically extracting and discharging goods from a product supply unit according to the order data and putting them at a predetermined standby space with a command of the control computer; and transmitting the customer differentiating data back to the customer computer to notify the pickup of the goods discharged and kept at the predetermined standby space.

At this time, it is preferable that the last step further includes the steps of: enabling the control computer to transmit the order data to a delivery company computer; and enabling the delivery company personnel to pick up the goods placed at the predetermined standby space and deliver the goods to a place designated in delivery place data of the shopping related data.

It is also preferable that the method for purchasing goods on the on-line e-commerce system further includes the steps of: enabling the control computer to transmit product refill signal data to the on-line e-commerce system when the number of goods stored in stock at the product supply unit gets below a predetermined level thereof; enabling the on-line e-commerce system to transmit the product refill signal data to computers of product suppliers; and enabling the product suppliers to refill requested goods up to the predetermined level thereof.

Furthermore, it is preferable that method for purchasing goods on the on-line e-commerce system additionally includes a step of enabling the on-line e-commerce system to transmit the user verifying data to a computer of a user verifying agency for on approval of dealings, after the step of storing the order data and before the step of transmitting the order data to the control computer.

BRIEF DESCRIPTION OF THE DRAWINGS

For fuller understanding of the nature and object of the invention, reference should be made to the following detailed description taken in conjunction with the accompanying drawings in which:

FIG. 1 is a block diagram of an automatic vending apparatus in accordance with a first embodiment of the present invention;

FIG. 2 is a block diagram for illustrating the relationship between a order window and an order control unit;

FIG. 3a is a perspective view for illustrating a product supply unit of an automatic vending apparatus in accordance with a preferred embodiment of the present invention;

FIG. 3b is a perspective view for illustrating E-type display column of a product supply unit;

FIG. 4 is a block diagram for illustrating a concept of networking display columns, conveyors and automatic packaging part of a product supply unit and a control computer;

FIG. 5 is a conceptual block diagram for illustrating the relationship of on-line e-commerce system and some components connected therewith in accordance with the embodiment of the present invention; and

FIG. 6 is a block diagram for illustrating a method of managing the inventory of goods in accordance with the embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Objects and aspects of the invention will become apparent from the following detailed description of preferred embodiments with reference to the accompanying drawings.

As shown FIG. 5, an on-line e-commerce system 5 is connected with a customer computer 502, a computer of a user verifying agency 504, a control computer 508 of an automatic vending apparatus 50 and a computer of a product supplier 506. At this time, the control computer 508 is also connected with a product delivery company computer 512. At the same time, the on-line e-commerce system 5 includes a shopping mall home page management module 5a, an order data base management module 5b, a user verifying management module 5c and an inventory management module 5d.

At this time, the shopping mall home page management module 5a provides a shopping mall home page, so that the customer computer 502 can visit to the shopping mall home page through wired/wireless internet networking systems. On the other hand, the shopping mall home page provides lists of goods through a web browser of the customer computer 502. The lists of products can be made in the form of text files or 3-dimensional graphic files. In the preferred embodiment of the present invention, the customer may make a selection to do shopping in the text mode or 3-dimensional mode of the shopping mall home page while the customer computer remains on the internet.

In addition, the order data base management module 5b stores the customer differentiating number data with the shopping related data and transmits the order data to the control computer.

As soon as the order data base management module 5b receives the shopping related data from the customer computer 502, the order data base management module 5b transmits the order data to the control computer 508, which automatically extracts and discharges the goods of the order data out of

the product supply unit 510 and places them at a predetermined standby space of the product supply unit 510. At the same time, the order data base management module 5b transmits the customer differentiating number data to the customer computer 502. As such, the customer can personally visit to the automated stores equipped with only automatic vending apparatuses 50 and pick up the ordered goods by using the customer differentiating number data.

On the other hand, if the customer wants the ordered goods to be delivered to a designated place instead of personally visiting to the stores and picking up the ordered goods, the delivery place data can be included in the shopping related data. Since the control computer 508 is kept connected with the delivery company computer 512, the delivery company receives the ordered goods from the product supply unit 510 and delivers them to a customer's designated place as soon as the order data is transmitted to the delivery company computer 512.

The inventory management module 5d includes an inventory data base specifying the current level of goods stored at the product supply unit 510. If the inventory of any goods stored at the product supply unit 510 gets under a predetermined number thereof, product refill signal data is transmitted from the control computer 508 to the product supplier computer 506. Also, as soon as the product supplier computer 506 receives the product refill signal data, the product supplier takes a measure to refill the required goods to the predetermined level thereof. The inventory management module 5d makes it possible to automatically manage the inventory of goods on the real-time basis.

The user verifying management module 5c transmits the user verifying data to the credit card verifying agency computer 504 for get an approval on dealings. A commonly used model can also be utilized for the user verifying management module.

The automatic vending apparatus 50 is provided to store, extract and discharge out a variety of goods, including a product supply unit 510 to store, extract and discharge out various goods and a control computer 508 to control all the related operations of storing, extracting and discharging goods. On the other hand, the automatic vending apparatus 50 can be constructed with only the product supply unit 510 to store, extract and discharge out goods. In the preferred embodiment of the present invention, the automatic vending apparatus 50 can be constructed to allow customers to personally visit and purchase goods.

FIG. 1 is a schematic diagram for illustrating the structure of the automatic vending apparatus in accordance with the preferred embodiment of the present invention. As described in FIG. 1, the automatic vending apparatus is constructed with a control computer and a product supply unit. On the other hand, the product supply unit includes card issuing device 16, order inputting device 17, account settling device 18 and product supplying device 19, all of which are respectively connected with client computers 10a, 10b, 10c, 10d which forms a LAN system with the control computer 1 through a hub.

At this time, the control computer 1 includes an order data base to simultaneously store customer differentiating card number data with shopping related data like a list of ordered goods and shopping time, or, if a customer makes an on-line order of goods, to store the customer differentiating number data, delivery place data and shopping related data of ordered goods.

Furthermore, the control computer 1 sends and receives control signals through client computers 10a, 10b, 10c, 10d connected with card issuing device 16, order inputting device 17, account settling device 18 and product supplying unit 19. In the drawings, all the client computers 10a, 10b, 10c, 10d are shown in connection with all parts of product supply unit for convenient description. However, the card issuing device 16 and account settling device 18 can be

simultaneously connected with one client computer. Even if the order inputting device 17 is illustrated with 4 order windows 17 in FIG. 1, the number of order windows 17 can also be increased to a predetermined number thereof at discretion. At this time, more additional client computer like the one 10b connected with the order inputting device 17 may be required depending on actual control capacity.

The card issuing device is a part to automatically issue a customer differentiating card to distinguish one customer from another when the customer personally visits to an automated store. In the preferred embodiment of the present invention, a RF-IC card issuing system is provided as the card issuing device. On the other hand, if a member customer obtains a membership card of the store in advance, differently from other newly visiting customers, the member customer can purchase goods with the previously issued member card. Therefore, the customer holding the membership card does not need a RF-IC card from the card issuing device. The RF-IC card is non-contact type with memory capacity of 1KB. Furthermore, the RF-IC card is passive type, not requiring battery, to be used about 100,000 times, with a characteristic feature of bi-directional recognition. It is preferable that the RF-IC card is designed to have a detection distance of less than 10cm by letting each customer have an individual ID number. As a result, the customer makes an order of goods and allows the payment to be approved with the customer differentiating card that has been issued by the automatic card issuing device. On the other hand, the card issuing device is constructed with card issuing button and card discharging outlet for a RF-IC card when a customer presses down the card issuing button. In addition, the card issuing device includes a card issuing control unit which has an Ethernet module communicating with the client computers to directly control the issuance of RF-IC cards. On the other hand, the card issuing device should be constructed with a control unit installed at a predetermined position thereof.

Furthermore, the first card reading device is installed at each order window of the order inputting device for reading the RF-IC card, making it possible to make an input of a customer's ID and order goods to purchase. The customer obtained a RF-IC card from the card issuing device selects desired goods at the touch screen type of order windows. When the selection is completed, the RF-IC card is read by the first card reading device. The customer's ID and ordered goods thus inputted are transmitted to the control computer, which simultaneously stores the customer's ID along with a list of the ordered goods at the order data base.

FIG. 2 is a block diagram for illustrating relationship of the order control unit, which controls functions of displaying goods at order windows, reading card and inputting on touch screens. As shown in FIG. 2, the order control unit is constructed with a display control portion to control a touch screen display method, a COM1 port to read the RF-IC card and a COM2 port to control the function of the touch screens, also including an ethernet module to communicate with the client computers. The control unit is installed at a predetermined position of the order windows.

The account settling device is means to approve the payment to be made by the customer who completed an order to purchase goods. As shown in FIG. 2, the second card reading device is equipped at the front side of the account settling device for reading the RF-IC card. As the customer lets the customer's RF-IC card read by the second card reading device, the control computer matches customer ID number data identical to the RF-IC card number and information on the list of ordered goods at the same time and transmits them to the client computer connected with the account settling device. Then, the client computer displays the aforementioned data at the display screen of the account settling device. On the other hand, there is also a cancellation button at the account settling device to let a customer to cancel the undesired goods. Then, any

changes in the list of the ordered goods should be immediately notified and continuously updated by sending changed data to the order data base of the control computer.

In addition, a payment approving window 18c is provided at the front side of the account settling device 18 to get an approval on the payment for the ordered goods. The payment approving window 18c includes coin and bill inlets and a credit card approving system to make an approval of payment with a credit card.

On the other hand, a quick order supporting function is added to the account settling device 18 for enabling a customer to immediately purchase goods without going through with an order inputting device 17. In other words, unique goods ID number is designated to each goods that can be purchased from the automatic vending apparatus. A book listing up the unique ID numbers and information on all the goods is distributed to possible customers in advance. In consequence, the customer can directly inputs goods ID numbers at the account settling device 18, thereby speeding up the purchase of goods. At this time, the inputting means may be a simplified key board or a touch screen device.

Furthermore, the account settling device 18 has a printed statement outlet (not shown) for discharging out a statement printed with a list of ordered goods and relevant charges. In order to get the ordered goods properly delivered, the customer should be well notified which outlet of the product supplying device 19 will be used for delivery of goods. Therefore, all the relevant information on the positions of the product supplying device 19 and its outlets through which the ordered goods will be discharged out will be notified with a printed statement and a display portion 18a.

On the other hand, there is also a control unit 14 of the account settling device 18 at a predetermined position for directly controlling the functions of

varying displaying screens of the display device 18a, reading a card and approving a payment. At this time, the control unit 14 of the account settling device 18 communicates with the client computers through an internal ethernet module.

There are a pair of product discharging outlets 19a at the front panel of the product supplying device 19 and a card receiving slot 19b on the lateral side of each product discharging outlet 19a. As the RF-IC card can be used about 100,000 times, it will be returned from the customer after purchase of goods. The card receiving slot 19b can be made in an insertion type. The card receiving slot 19b is controlled to refrain the product supplying device 19 from starting the operations of discharging, transporting and discharging out the ordered goods until the RF-IC card is returned from the customer through the card receiving slot 19b. In addition, at the front panel of the product supplying device 19 there is also provided inputting means with which a customer, who orders goods on the on-line, or a personnel of a delivery company, who comes to pick up ordered goods, can make an input of the customer's differentiating number to finally receive the ordered goods. A touch screen or key pad can be selectively used as the inputting means. The customer or the delivery company personnel makes an input of the customer's differentiating number, as informed by the on-line e-commerce system or by the computer of the delivery company, and then receives the ordered goods or receives and delivers them to a designated place.

On the other hand, a means is provided to scan out the ID of a RF-IC card in the card receiving slot 19b. If the membership card is inserted into the card receiving slot 19b, the reading means recognizes a customer's ID number of a membership card and then extracts the card through the card receiving slot 19b. Furthermore, besides the card receiving slot 19b, a membership card reading device can be installed at a predetermined position of the product discharging outlet for an exclusive use of member customers. When the membership card is

read by the membership card reading device, ordered goods can start being extracted, transported and discharged. The product supplying device 19 also has a product supply control unit 15 assembled at a predetermined position to control all the functions of extracting, transporting and discharging goods and returning the membership card back to the customer. On the other hand, the control unit 15 also communicates with the client computer by way of the internal ethernet module.

In the preferred embodiment of the present invention thus constructed, the control units 12, 13, 14, 15 are networked with the control computer 1 by means of the client computers 10a, 10b, 10c, 10d. However, it is preferable that the client computers and control units are also constructed in a single embedded system, thereby making into a module of control clients installed at all the parts 16, 17, 18, 19 directly networked with the control computer 1 through a hub. The embedded system can be a small computer designed to have all functions of a general computer including a communication function.

Next, one component of the product supplying device 19, the product supply unit will be described with reference to FIGS. 3a and 3b. The product supply unit is constructed with a product storage rack 31, sub-conveyor 34, main conveyor 32a, 32b and auto-packaging devices 36a, 36b. On the other hand, even if not shown in the drawings, there is a space around the product discharging outlet, where the goods ordered on the on-line internet and completely packaged can be placed for the delivery company personnel to pick up by inputting a customer differentiating number. As described above, the product storage rack 31 includes a plurality of rows of column assemblies 35 arranged in a predetermined gap. At this time, each column assembly is made up of a plurality of display columns, each of which is made in different shape according to the type of products to be displayed thereon. On the other hand, the sub-conveyor 34 is installed close to the front, lower end of the column

assemblies 35, and the main conveyors 32a, 32b are positioned close to both ends of the sub-conveyor 34, being extended in perpendicular to the longitudinal direction of the sub-conveyor 34. The auto-packaging units 36a, 36b are disposed at a predetermined distance away from the product discharging outlet for automatically packaging and discharging out the ordered and transported goods. The auto-packaging units 36a, 36b have been disclosed and well known as parts of an automatic vending apparatus. In the drawings, the main conveyors 32a, 32b are installed at both sides of the product storage rack. However, there may be only a single main conveyor at one side of the product storage rack in the automatic vending apparatus.

At this time, an A-type display column is adequate for displaying products difficult to display inconsistent, changeable shapes of products such as vinyl bags of cookies or light, thin, inseparable products such as stockings or chewing gums. A B-type display column is good for products having a circular cross-sectional shape such PET bottled beverages as canned drinks in the conventional vending machine. A C-type display column is proper for such trapezoid products, hard to be accumulated due to a lid, or complicatedly shaped or fragile ones like a sprayer as shown in the conventional cupped quick noodle vending machine. A D-type display column is suitable for such boxed cookies as shown in the conventional cigarette vending machine. In addition, an E-type display column is good for heavy or not uniformly shaped goods like packaged rice, other packaged crops and packaged vegetables. FIG. 3b is a perspective view for illustrating the E-type display column. Goods are stocked on plates 305, 307 of the E-type display columns supported by supporting rods 301. A thin long hole 309 is formed to get the supporting rods 301 inserted at the center of the part where the plates 305, 307 are supported with the supporting rods 301. On the other hand, a belt 315 is rotated by a driving part 313 for a vertical movement of the plates 305, 307. At this time, the plate 305 positioned at the bottom is

tilted forwards to discharge out goods, sliding them down while being inserted at holes 311a, 311b for collection.

FIG. 4 is a conceptual block diagram for illustrating a network of display columns, conveyors, auto-packaging units, product discharging outlets, a card receiving slot and the control computer 1. The display column is a smallest unit of a product storage part to make up a column assembly with corresponding control addresses to control operations of extracting products and driving the driving part. In other words, a product is to be extracted by a driving part driven by a control part. In the aforementioned embodiment of the present invention, the control part is constructed with one chip microprocessor (hereinafter referred to as a MIC). Also, an inventory monitoring sensor is attached at a predetermined part of the display columns. When the number of goods in stock gets down under a predetermined level thereof, the inventory monitoring sensor detects the shortage of goods and the control part transmits product refill signal data to the control computer. The control computer transmits the signal data to the on-line e-commerce system to thereby achieve an automatic inventory management of goods in stock. Also, the sub-conveyors, main conveyor, auto-packaging units, product discharging outlets and card returning slot also have respective driving parts and control parts of MICs.

The MICs are connected with product supply control units 15. In the preferred embodiment of the present invention, a control units 15 is a distributed input/output embedded system of a protocol converter. In other words, the MICs are connected with the client computer 10d by means of the protocol converter 15. The protocol converter 15 enables a plurality of MICs to be connected by a field bus interface on a pair of wires, thereby significantly cutting down the installation cost of the control system. Also, the protocol converter 15 plays a role to connect lower RS-485 and upper TCP/IP communications. On the other hand, the protocol converter 15 includes a switch and router function,

and RS-485 is used as one port, constructing a multi-drop type network. There are about 4 to 8 field ports of the protocol converter, and each field port can have 32 multi-drop type field points. In consequence, one protocol converter can have a maximum of 256 control points. In the preferred embodiment of the present invention, one protocol converter 15 can have 256 MICs of control points. One of the MICs can directly control the maximum of 4 display columns. As a result, one protocol converter 15 is designed to control the maximum of 1024 display columns. With more display columns, a plurality of protocol converters can be used to make a LAN by means of a hub to control thousands of display columns.

In addition, the MIC actually gets the direct control of display columns with a field bus communication function. In general, one MIC has an input/output port of over 8 bits. When one MIC controls more than two display columns, it is possible to reduce the cost for constructing a total network of display columns. The communication function of the MIC can be made in the simple form with attachment of RS-485 transceiver on the CPU embedded with a universal asynchronous receiver/transmitter (UART). An external UART can be installed for a high-speed data transmission of over 19,200bps.

On the other hand, as shown in FIG. 1, instead of the protocol converter 15 connected to the client computer 10d, the protocol converter 15 can be directly connected with the control computer 1 by means of a hub for constructing a network.

Next, an inventory management method will be described in accordance with the preferred embodiment of the present invention with reference to FIGS. 5 and 6. When the inventory monitoring sensor 62a installed in the display column 62 of the product supply unit 510 detects a reduction in the number of products below the predetermined level thereof, the control part 62b of the

display column 62 transmits product refill signal data via the control computer 508 to the inventory management module 5d of the on-line e-commerce system 5, which transmits the signal data to the computer 506 of the product supplier to refill required goods to the product supplying device 510. The automatic inventory management method as such makes it possible to efficiently carry out an automatic inventory management on the real time basis.

Then, description will be made about the steps from a customer's ordering goods to finally getting the ordered goods delivered to a customer. Customers may personally come in and shop at the automated stores or visits to the stores by using the on-line computer system. However, all the customers are assumed to make a payment only with credit cards.

At first, the coming in customers personally visit to an automated store having automatic vending apparatuses to purchase goods. Any shopper without a membership card can obtain a customer differentiating card from the card issuing device and order desired goods at the order inputting device. Member shoppers can order goods with their previously issued member cards at the order inputting device. The visiting shoppers make an approval of the payment through a credit card approving system of the account settling device. RF-IC cards are selected and used for the customer differentiating cards and member cards.

On the other hand, the on-line customer gets connected by a web browser with the shopping mall home page on an on-line communication network of the wired/wireless internet system and inputs required customer information including a list of ordering goods and credit card number. Then, the customer information of the on-line customer is transmitted to the on-line e-commerce system via the customer computer.

The on-line e-commerce system transmits the customer information on the

customer's credit card number sent by the customer computer and by the control computer to the computer of the credit card verifying agency, and requests an approval on utilization of the credit card to pay for the ordered goods. If the computer of the credit card verifying agency receives the request on approval of the credit card from the on-line e-commerce system and finds no problem in the request, it transmits an approval number data back to the on-line e-commerce system.

In other words, the computer of the credit card verifying agency transmits approved data on credit card number to the on-line e-commerce system and, at the same time, the data on customer's use of the credit card to the computer of the banking agency.

After the computer of the banking agency receives the data on the customer's use of the credit card and approved the customer's credit card number, the payment is to be made from the customer's account and deposited to the on-line e-commerce operator's account. Such deposit is immediately to be notified to the on-line e-commerce system.

Then, the on-line e-commerce system confirming the approved credit card number data is to transmit the approved credit card number data to the control computer and the customer computer. At this time, the control computer and customer computer are to show on the payment approving window of the account settling device or the monitor of the customer computer a message confirming the completion of the customer's payment. If the customer makes sure of his intention on reception of the goods at the payment approving window or customer computer, a printed receipt or statement on the purchase of goods are to be issued or transmitted to the account settling device or customer computer.

On the other hand, if the on-line customer wants the ordered goods to be delivered to a designated place and inputs information on the designated place

through the shopping mall home page, the on-line e-commerce system transmits all the shopping related data including the customer's differentiating number, ordered goods and a designated delivery place to the control computer of an automated vending store located closest to the customer's designated delivery place. Then, the control computer of the automated vending store transmits the same required information to the delivery company computer connected there between.

When a delivery company personnel is notified about the customer differentiating number and a designated place, the personnel personally visits to the automated vending store, inputs the customer differentiating number at the input means in the front panel of the product supply part and picks up all the goods placed at the predetermined standby space of the product supply part. Since the order data base management module of the on-line e-commerce system has transmitted the customer differentiating number data to the customer computer, it becomes possible for the delivery company personnel to confirm with the customer differentiating number data that all the ordered goods have been extracted, discharged out and delivered to the customer.

While the invention has been described in terms of a single preferred embodiment, those skilled in the art will recognize that the invention can be practiced with modification within the spirit and scope of the appended claims.

As described above, there is an advantage in the on-line e-commerce system of the present invention in that all the goods ordered on the on-line e-commerce system can be automatically extracted, packaged, discharged and placed ready for pick-up to thereby reduce the delivery time taken for the ordered goods delivered to the customer.

In addition, there is another advantage in the on-line e-commerce system according to the present invention in that, the inventory stored at the automatic

vending apparatuses installed in the automated vending stores gets below a predetermined number of goods, inventory refill signal data are to be transmitted to product suppliers via the e-commerce server to thereby make it possible to automatically manage the inventory of goods on the real time basis.

What is claimed is:

1. An on-line e-commerce system using automatic vending apparatuses with a product supply unit to store, extract and discharge out a variety of goods and a control computer to control all the automatic operations of extracting and discharging ordered goods, the system including:

a shopping mall management module to provide a shopping mall home page and receive an input of shopping related data like a list of ordered goods and user verifying data like customer's credit card number; and

an order data base management module to store the shopping related data in conjunction with the customer differentiating number data as order data and transmit the order data to the control computer, wherein, if the order data base management module receives the shopping related data from the customer computer, the order data base management module sends the order data to the control computer which will automatically extract and discharge the ordered goods listed in the order data from the product supply unit and put them at a predetermined standby space and, at the same time, sends the customer differentiating number data to the customer computer to enable the customer to pick up the ordered goods.

2. The system, as defined in claim 1, wherein the shopping related data include delivery place data, and the control computer is also kept connected with a computer of a delivery company that delivers the ordered goods from the product supply unit to a delivery place designated with the delivery place data by a customer.

3. The system, as defined in claim 1 or 2, additionally including: an inventory data base constructed to monitor inventory of all the goods stored at the product supply unit; and, if the number of goods stored at the product supply unit gets below a predetermined level thereof, an inventory management module

to receive inventory refill signal data from the control computer and transmit the inventory refill signal data to a computer of a product supplier to refill goods, wherein the product supplier refills the required goods up to the predetermined number thereof if the product supplier computer receives the inventory refill signal data.

4. The system, as defined in claim 3, additionally including a user verifying management module which sends the user verifying data to a computer of a user verifying agency for an approval of dealings.

5. A method for operating an on-line e-commerce system using automatic vending apparatuses which respectively include a product supply unit to store, extract and discharge a variety of goods for automated marketing processes and a control computer to control the automated operations of extracting and discharging ordered goods, the method including the steps of:

receiving an input of shopping related data like a list of ordered goods and user verifying data like customer's credit card number from a customer's personal computer which is connected with a shopping mall home page provided by the on-line e-commerce system;

storing the shopping related data in conjunction with the customer differentiating number data as order data;

transmitting the order data to the control computer when the shopping related data is input at the customer computer;

automatically extracting and discharging goods from a product supply unit according to the order data and putting them at a predetermined standby space with a command of the control computer; and

transmitting the customer differentiating data back to the customer computer to notify the pickup of the goods discharged and kept at the predetermined standby space.

6. The method, as defined in claim 5, wherein the last step further includes the steps of:

enabling the control computer to transmit the order data to a delivery company computer; and

enabling the delivery company personnel to pick up the goods placed at the predetermined standby space and deliver the goods to a place designated in delivery place data of the shopping related data.

7. The method, as defined in claim 5 or 6, further including the steps of:

enabling the control computer to transmit product refill signal data to the on-line e-commerce system when the number of goods stored in stock at the product supply unit gets below a predetermined level thereof;

enabling the on-line e-commerce system to transmit the product refill signal data to computers of product suppliers; and

enabling the product suppliers to refill requested goods up to the predetermined level thereof.

8. The method, as defined in claim 7, after the step of storing the order data and before the step of transmitting the order data to the control computer, additionally including a step of enabling the on-line e-commerce system to transmit the user verifying data to a computer of a user verifying agency for an approval of dealings.

FIG. 1

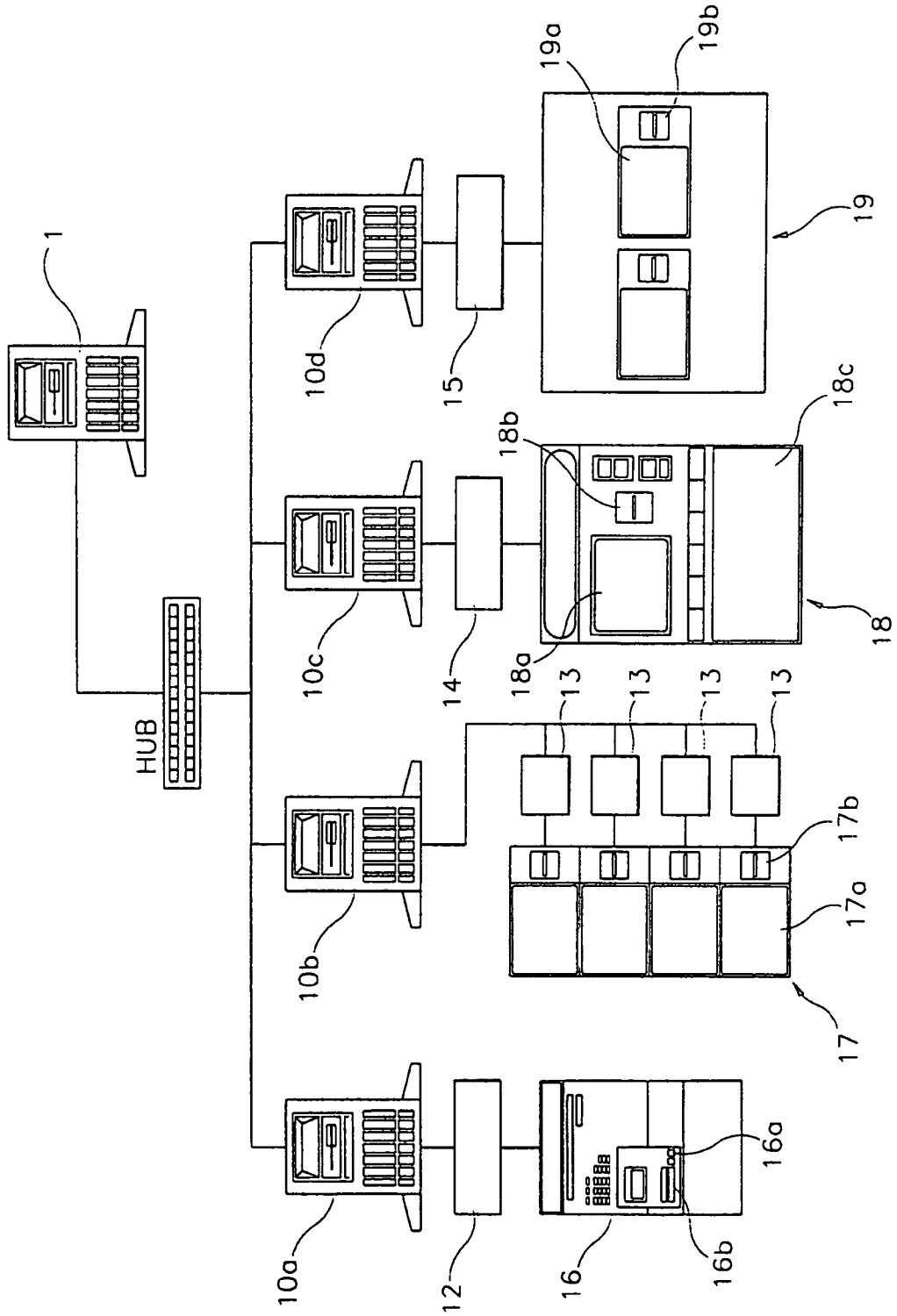

FIG.2

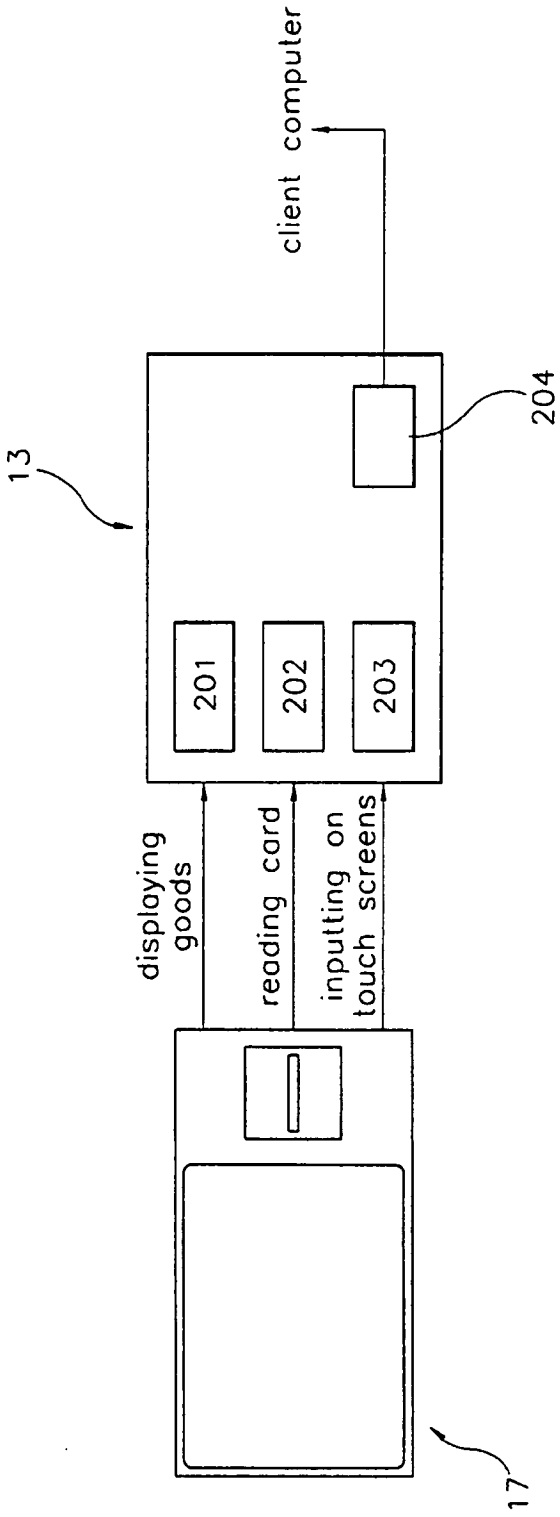

FIG.3a

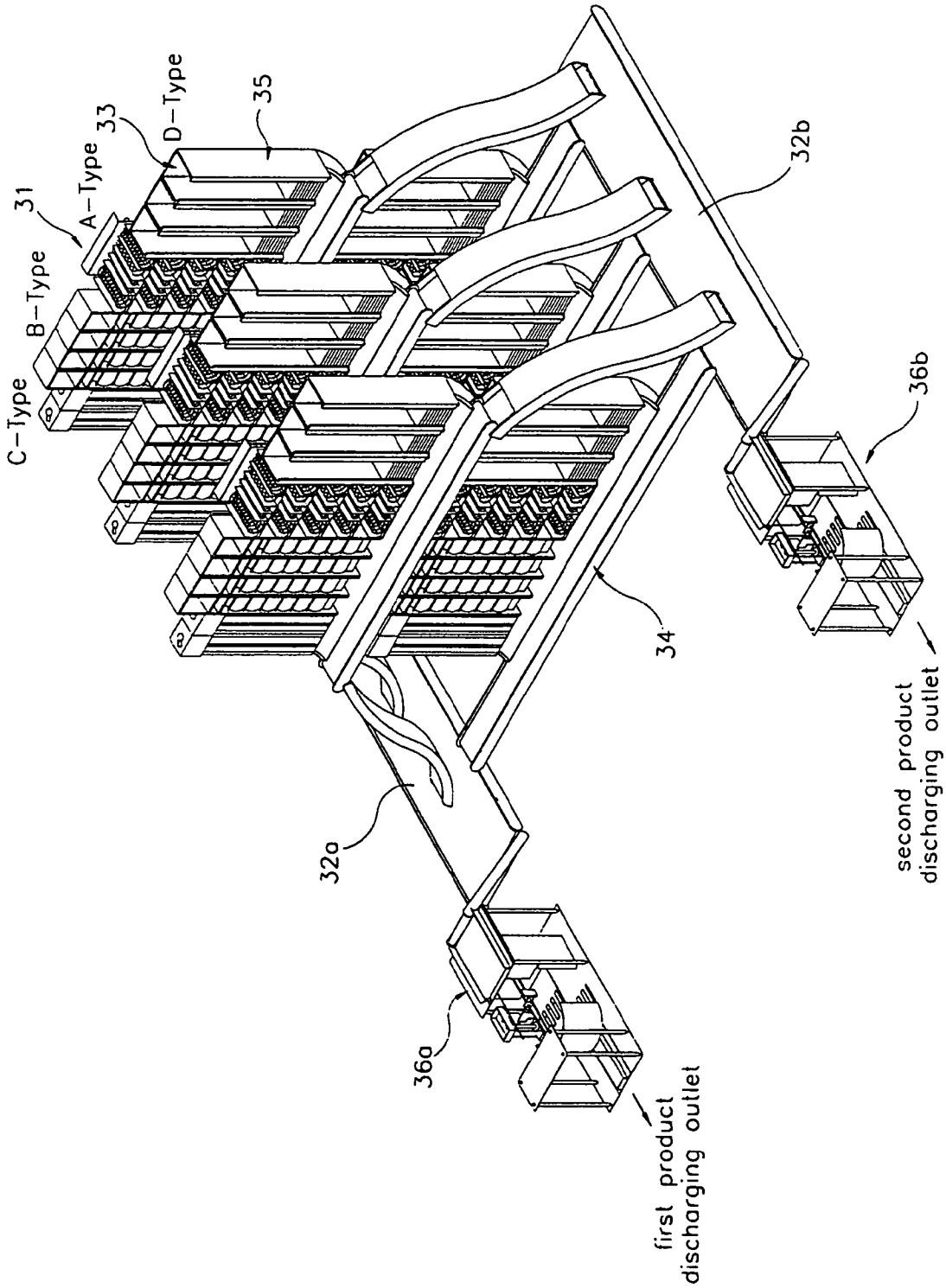

FIG.3b

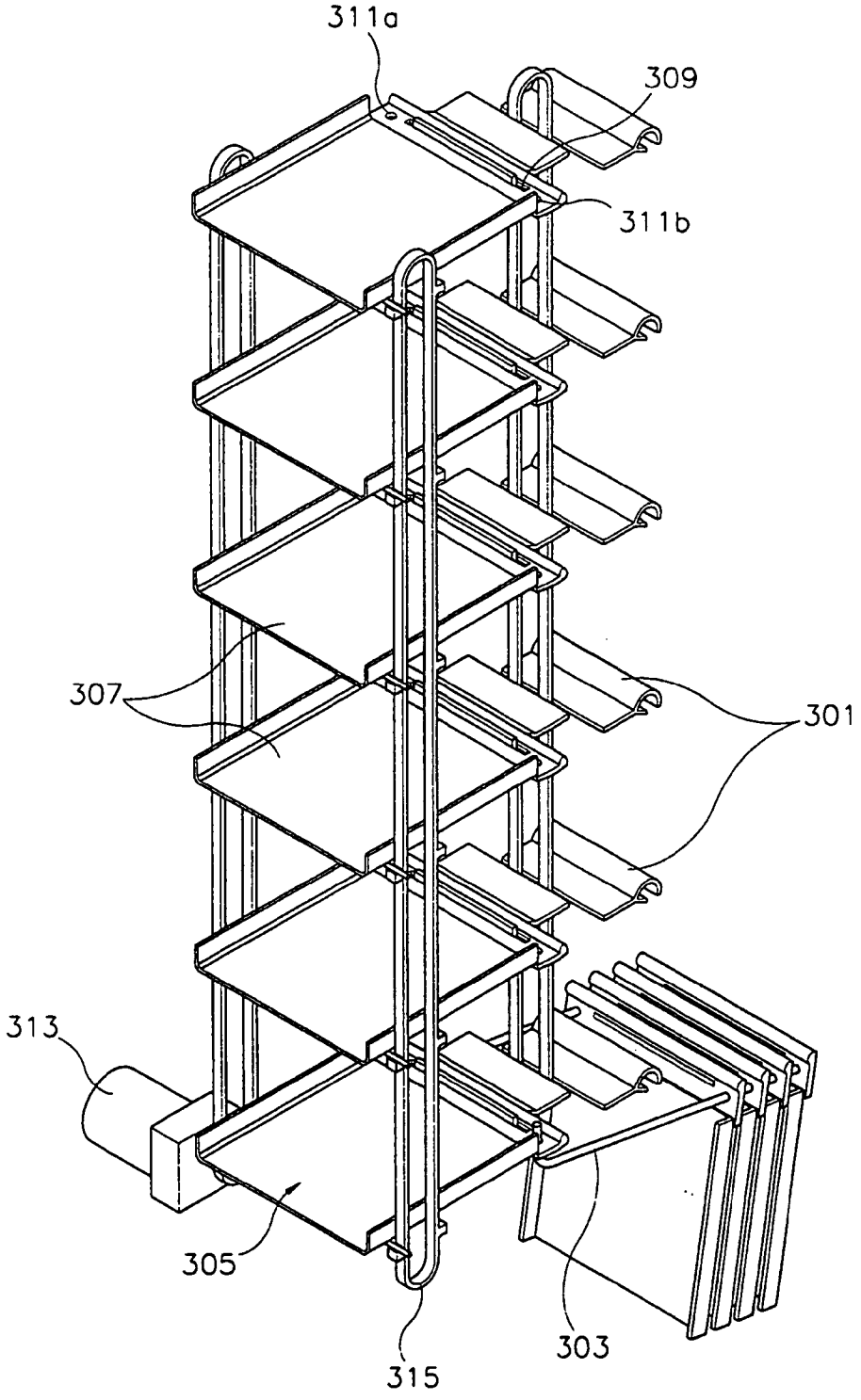

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FIG. 4

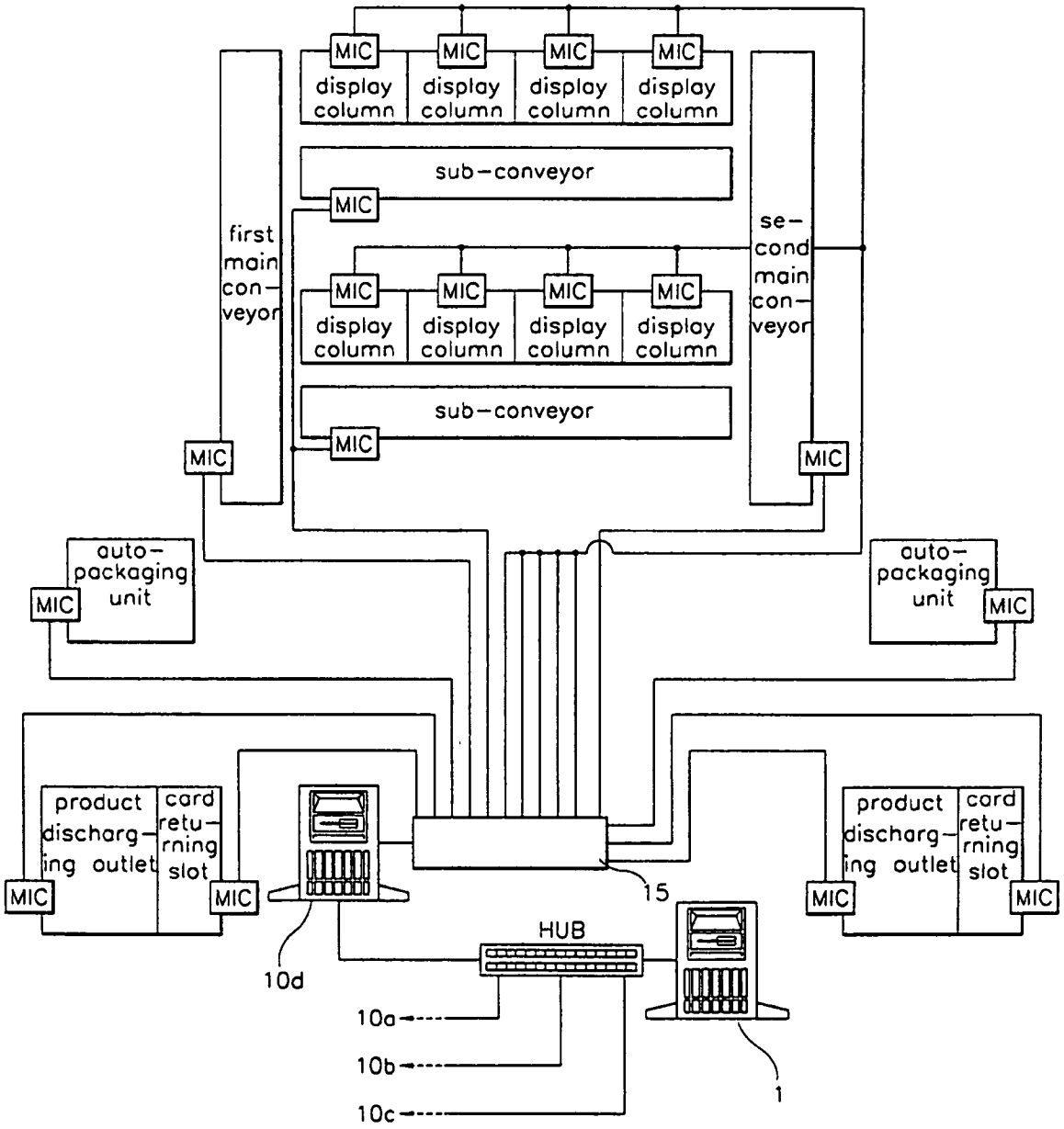


FIG.5

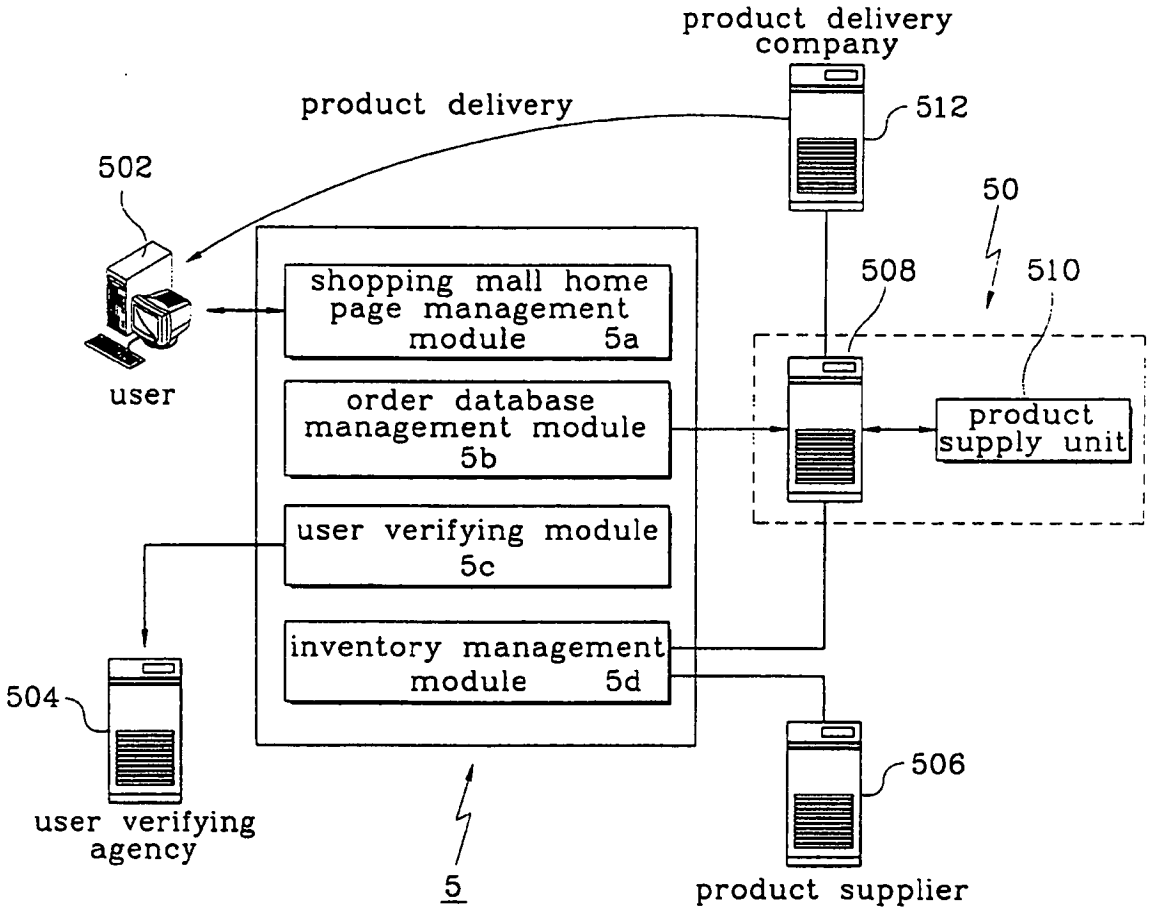
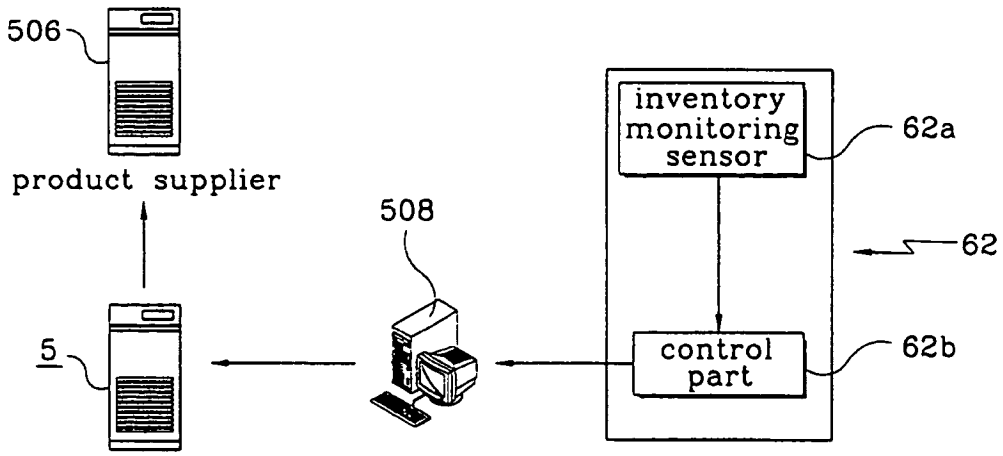


FIG.6



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR00/00944

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 G07F 17/40

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimun documentation searched (classification system followed by classification symbols)

IPC7 G07F 17/40, G07F 9/00, G06F

Documentation searched other than minimun documentation to the extent that such documents are included in the fileds searched

Electronic data base consulted during the intertnational search (name of data base and, where practicable, search trerms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 09-330470 A (KIYOUSERA MULTI MEDIA CORP) 22 DECEMBER 1997 CLAIMS & ABSTRACT & FIGURE 1, 2, 5, 6, 7, 8	1 - 8
Y	JP 11-306424 A (ISA CORP) 5 NOVEMBER 1999 see the whole document	1 - 8
Y	JP 09-288696 A (TECHNICAL CO LTD) 4 NOVEMBER 1997 see the whole document	1, 4, 5, 8
Y	JP 01-290073 A (SANYO ELECTRIC CO LTD) 21 NOVEMBER 1989 see the whole document	1, 2, 5, 6
Y	JP 02-187859 A (SANYO ELECTRIC CO LTD) 24 JULY 1990 see the whole document	1, 2, 5, 6
Y	JP 06-282731 A (SANYO ELECTRIC CO LTD) 7 OCTOBER 1994 see the whole document	3, 7
A	JP 09-190571 A (FUJI ELECTRIC CO LTD) 22 JULY 1997 see the whole document	2, 3, 5, 6

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
22 DECEMBER 2000 (22.12.2000)	26 DECEMBER 2000 (26.12.2000)

Name and mailing address of the ISA/KR	Authorized officer
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR00/00944

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 09-218975 A (FUJI ELECTRIC CO LTD) 19 AUGUST 1997 see the whole document	1

Form PCT/ISA/210 (continuation of second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/KR00/00944

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP - A- 09330470	22 - 12 - 97	NONE	
JP - A - 11306424	05 - 11 - 99	NONE	
JP - A - 09288696	04 - 11 - 97	NONE	
JP - A- 01290073	21 - 11 - 89	NONE	
JP - A - 02187859	24 - 07 - 90	NONE	
JP - A - 06282731	07 - 10 - 94	NONE	
JP - A - 09190571	22 - 07 - 97	NONE	
JP - A - 09218975	19 - 08 - 97	NONE	